

## AMENDMENTS TO THE CLAIMS

**This listing of claims will replace all prior versions and listings of claims in the application:**

### LISTING OF CLAIMS:

1. (currently amended): A non-aqueous secondary battery which employs a negative electrode in which the negative electrode active material is a material capable of lithium doping/dedoping, a positive electrode in which the positive electrode active material is a lithium-containing transition metal oxide, and a non-aqueous electrolyte solution as the electrolyte solution, wherein

(1) the separator is composed of a porous film made of a porous polymer, which includes a network-like support, and swells in the electrolyte solution and retains said electrolyte solution,

(2) said network-like support has a mean film thickness of 10-30  $\mu\text{m}$ , a basis weight of 6-20  $\text{g}/\text{m}^2$ , a Gurley value (JIS P8117) of no greater than 10 sec/100 cc, a McMullin number of no greater than 10 at 25°C and a (McMullin number x film thickness) product of no greater than 200  $\mu\text{m}[[.]]$ ,

(3) said separator has a mean film thickness of 10-35  $\mu\text{m}$ , a basis weight of 10-25  $\text{g}/\text{m}^2$  and a Gurley value (JIS P8117) of no greater than 60 sec/100 cc, and

(4) the following relationship:

$$Q_{pr}W_p < q_m + Q_nW_n < 1.3Q_pW_p \quad I$$

is satisfied, wherein the value of the total amount of lithium in the positive electrode active material in terms of electric

charge is  $Q_p$  (mAh/mg), the amount of lithium utilized for charge-discharge reaction of the lithium in the positive electrode active material in terms of electric charge is  $Q_{pr}$  (mAh/mg), the value of the amount of lithium which can be doped in the negative electrode active material in terms of electric charge is  $Q_n$  (mAh/mg), the value for the overcharge-preventing function of the separator is  $q_m$  (mAh/cm<sup>2</sup>), the weight of the positive electrode active material is  $W_p$  (mg/cm<sup>2</sup>) and the weight of the negative electrode active material is  $W_n$  (mg/cm<sup>2</sup>).

2. (original): A battery according to claim 1, wherein  $Q_{pr}W_p/Q_nW_n = 0.7-1.05$ .

3. (original): A battery according to claim 1, wherein said positive electrode active material is a lithium-containing transition metal oxide represented by  $LiMO_2$ , where M is at least one metal element selected from the group consisting of cobalt, nickel, manganese, aluminum, iron, titanium and vanadium, and at least 1/3 of the atomic ratio composition of M is cobalt or nickel.

4. (original): A battery according to claim 1, wherein said positive electrode active material is a lithium-containing transition metal oxide represented by  $LiM_2O_4$  where M is at least one metal element selected from the group consisting of manganese, magnesium, nickel, cobalt, chromium, copper, iron and boron, and at least 1/3 of the atomic ratio composition of M is manganese.

Preliminary Amendment  
Based on PCT/JP03/10585

5. (original): A battery according to claim 1, wherein said positive electrode active material is lithium nickelate ( $\text{LiNiO}_2$ ).

6. (original): A battery according to claim 1, wherein said positive electrode active material is lithium manganate ( $\text{LiMn}_2\text{O}_4$ ).

7. (original): A battery according to claim 1, wherein said positive electrode active material is composed of lithium manganate ( $\text{LiMn}_2\text{O}_4$ ) and lithium nickelate ( $\text{LiNiO}_2$ ).

8. (original): A battery according to claim 1, wherein said network-like support is a nonwoven fabric.

9. (original): A battery according to claim 8, wherein the fiber composing said nonwoven fabric is composed of at least one type of high-molecular-weight polymer selected from the group consisting of polyolefins, polyphenylene sulfide, aromatic polyamides and polyesters.

10. (original): A battery according to claim 1, wherein said network-like support is a cloth.

11. (original): A battery according to claim 10, wherein said network-like support is a glass cloth.

12. (currently amended): A battery according to ~~any one of claims 1 to 11~~claim 1, wherein the overcharge-preventing

Preliminary Amendment  
Based on PCT/JP03/10585

function value  $q_m$  of said separator is in the range of 0.1-1.5 mAh/cm<sup>2</sup>.

13. (original): A battery according to claim 12, wherein the overcharge-preventing function value  $q_m$  of said separator is in the range of 0.1-1.0 mAh/cm<sup>2</sup>.

14. (currently amended): A non-aqueous secondary battery which employs a negative electrode in which the negative electrode active material is a material capable of lithium doping/dedoping, a positive electrode in which the positive electrode active material is a lithium-containing transition metal oxide, and a non-aqueous electrolyte solution as the electrolyte solution, wherein

(1) the separator is composed of a porous film made of a porous polymer, which includes a network-like support, swells in the electrolyte solution and retains said electrolyte solution,

(2) said network-like support has a mean film thickness of 10-30  $\mu\text{m}$ , a basis weight of 6-20 g/m<sup>2</sup>, a Gurley value (JIS P8117) of no greater than 10 sec/100 cc, a McMullin number of no greater than 10 at 25°C and a (McMullin number  $\times$  mean film thickness) product of no greater than 200  $\mu\text{m}[[.]]$ ,

(3) said separator has a mean film thickness of 10-35  $\mu\text{m}$ , a basis weight of 10-25 g/m<sup>2</sup> and a Gurley value (JIS P8117) exceeding 60 sec/100 cc and no greater than 500 sec/100 cc, and

(4) the following relationship:

$$Q_{pr}W_p < q_m + Q_nW_n < 1.3Q_pW_p \quad I$$

is satisfied, wherein the value of the total amount of lithium in the positive electrode active material in terms of electric

charge is  $Q_p$  (mAh/mg), the amount of lithium utilized for charge-discharge reaction of the lithium in the positive electrode active material in terms of electric charge is  $Q_{pr}$  (mAh/mg), the value of the amount of lithium which can be doped in the negative electrode active material in terms of electric charge is  $Q_n$  (mAh/mg), the value for the overcharge-preventing function of the separator is  $q_m$  (mAh/cm<sup>2</sup>), the weight of the positive electrode active material is  $W_p$  (mg/cm<sup>2</sup>) and the weight of the negative electrode active material is  $W_n$  (mg/cm<sup>2</sup>).

15. (original): A battery according to claim 14, wherein  $Q_{pr}W_p/Q_nW_n = 1.05-4.0$ .

16. (original): A battery according to claim 14, wherein said positive electrode active material is a lithium-containing transition metal oxide represented by  $LiMO_2$ , where M is at least one metal element selected from the group consisting of cobalt, nickel, manganese, aluminum, iron, titanium and vanadium, and at least 1/3 of the atomic ratio composition of M is cobalt or nickel.

17. (original): A battery according to claim 14, wherein said positive electrode active material is a lithium-containing transition metal oxide represented by  $LiM_2O_4$  where M is at least one metal element selected from the group consisting of manganese, magnesium, nickel, cobalt, chromium, copper, iron and boron, and at least 1/3 of the atomic ratio composition of M is manganese.

Preliminary Amendment  
Based on PCT/JP03/10585

18. (original): A battery according to claim 14, wherein said positive electrode active material is lithium nickelate ( $\text{LiNiO}_2$ ).

19. (original): A battery according to claim 14, wherein said positive electrode active material is lithium manganate ( $\text{LiMn}_2\text{O}_4$ ).

20. (original): A battery according to claim 14, wherein said positive electrode active material is composed of lithium manganate ( $\text{LiMn}_2\text{O}_4$ ) and lithium nickelate ( $\text{LiNiO}_2$ ).

21. (original): A battery according to claim 14, wherein said network-like support is a nonwoven fabric.

22. (original): A battery according to claim 21, wherein the fiber composing said nonwoven fabric is composed of at least one type of high-molecular-weight polymer selected from the group consisting of polyolefins, polyphenylene sulfide, aromatic polyamides and polyesters.

23. (original): A battery according to claim 14, wherein said network-like support is a cloth.

24. (original): A battery according to claim 23, wherein said network-like support is a glass cloth.

25. (currently amended): A battery according to ~~any one of 14. to 24~~ claim 14, wherein the overcharge-preventing function value  $q_m$  of said separator is in the range of 1.0-5.0 mAh/cm<sup>2</sup>.

26. (original): A battery according to claim 25, wherein the overcharge-preventing function value  $q_m$  of said separator is in the range of 1.5-3.0 mAh/cm<sup>2</sup>.

27. (original): A battery separator composed of a porous film made of a polymer, which includes a network-like support, and swells in the electrolyte solution and retains said electrolyte solution, wherein said network-like support has a mean film thickness of 10-30  $\mu\text{m}$ , a basis weight of 6-20 g/m<sup>2</sup>, a Gurley value (JIS P8117) of no greater than 10 sec/100 cc, a McMullin number of no greater than 10 at 25°C and a (McMullin number x mean film thickness) product of no greater than 200  $\mu\text{m}$ , and said porous film has a mean film thickness of 10-35  $\mu\text{m}$ , a basis weight of 10-25 g/m<sup>2</sup> and a Gurley value (JIS P8117) exceeding 60 sec/100 cc and no greater than 500 sec/100 cc.

28. (original): A separator according to claim 27, wherein said network-like support is a nonwoven fabric.

29. (original): A separator according to claim 28, wherein the fiber composing said nonwoven fabric is composed of at least one type of high-molecular-weight polymer selected from the group consisting of polyolefins, polyphenylene sulfide, aromatic polyamides and polyesters.

30. (original): A separator according to claim 27, wherein said network-like support is a cloth.

Preliminary Amendment  
Based on PCT/JP03/10585

31. (original): A separator according to claim 30, wherein said network-like support is a glass cloth.

32. (original): A separator according to claim 27 above, wherein said organic polymer is polyvinylidene fluoride (PVdF), a PVdF copolymer or a compound composed mainly of PVdF.